Varian Semiconductor Equipment Inc

Massachusetts Manufacturing Extension Partnership

Varian Semiconductor Equipment, Inc. Doubles Throughput with Lean

Client Profile:
Varian Semiconductor Equipment Associates Inc., (VSEA) designs, manufactures, markets and services semiconductor processing equipment used in the production of integrated circuits with all major semiconductor manufacturers worldwide. The company has facilities in Gloucester and Newburyport, Massachusetts as well as in other countries. The Gloucester facility employs 280 people.

Situation:
Varian's market share has nearly doubled, which has increased the pressure on the competition. Competitor's products which are similar to Varian's are sometimes offered at lower pricing in an effort to compete from a technical standpoint. At the same time, Varian is continually finding ways to lower its manufacturing cost. "Competition and the need to keep costs low are two reasons we chose to get involved with Lean," said Tom Faulkner, VSEA Manufacturing Product Line Manager. "Lean helps to get the entire workforce involved in identifying opportunities to reduce waste." Tim Wadlow, a project manager with the Massachusetts Manufacturing Extension Partnership (Mass MEP), a NIST MEP network affiliate, added, "Varian recognized the benefits of Lean and had some success with their own initiatives in manufacturing. They contacted Mass MEP to assist them with implementation and education company-wide."

Solution:
Varian had struggled for a number of years with issues over hand tools used in the manufacturing process. The tools were owned by individual employees and were constantly missing or 'walking away.' As a result, tool boxes were locked at the end of each shift. Since the Varian Tool Crib only operated during the first shift, employees who worked the second through fifth shifts and needed access to hand and specialty tools were left with an inadequate supply. It was estimated that 30 to 60 minutes per person per day was lost while employees searched for tools. Mass MEP provided Value Stream Mapping (VSM) training for Varien employees to identify problems in some of their processes. Teams were then launched to create improvements on the shop floor through Kaizen activities. During one of these events, a second shift team took on the issue of tools and began by modeling a common tool box and determining what tools it should contain. They created a prototype and convinced VSEA management to invest in 50 identical tool boxes. The company tool boxes were standardized and fitted with foam cutouts to hold the tools in each drawer. The tool boxes are kept unlocked, and overall responsibility for the tool boxes is assigned to various employees for each shift.
The Universal End Station (UES) is one component of the huge ion implantation equipment which is common to three of the four Varian manufactured products. UES is the highest volume assembly area at Varian. The maximum output of these units was only about two-thirds of what was required at times of peak implanter production, which caused bottlenecks in several processes. With the rapid increase in Varian's market share growth, UES production continued to get busier. Tim Wadlow and Linda Ellis

of the New Hampshire Manufacturing Extension Partnership (NH MEP), a NIST MEP network affiliate, were invited to facilitate a VSM of the UES assembly process with a cross functional employee team. UES's were constructed in an assembly line-like sequence - several units in a line being manufactured simultaneously and then moved along the production line. Work times had to be scheduled to allow for the various assembly functions. If a supplier was late with a delivery or if there was a technical problem with a unit, those UES's behind it on the line were delayed. The team discovered that if they split the unit in half rather than working on them at finished height, they could put the top half on a lift table with wheels and run it parallel along side the bottom half of the unit. Both sections could be assembled at the same time. Then once completed, the two halves would be joined together just prior to the assembly testing process. Throughput has doubled as a result of the new procedure.

Results:
* Increased throughput by 50 percent.
* Reduced labor hours by more than 30 percent.
* Reduced cycle time by 20 percent.
* Reduced floor space by 25 percent.

Testimonial:
"Working with Mass MEP kept us focused on Lean and provided employees with a good fundamental understanding of the concepts behind Lean. Our relationship with the MEP has helped on many occasions to implement changes which have improved employees skills and satisfaction. This in turn has resulted in an increase in throughput and a decrease in costs. This is a very beneficial relationship that helped get us going on our Lean initiatives."

Tom Faulkner, Manager, Manufacturing Production Line